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B. Length of loxodromics from equator and zero-meridian to meridians 90, 180, 270, 360 in miles.

Longitude.	Length of Loxodromic.
0	0
90	3247
180	4152
270	4344
360	4384

The entire length of the loxodromic is $S = \sqrt{(2)\frac{1}{2}\pi.R} = 8788$ miles, which is obtained by putting in (9) $b=0$, or in (11) $\varepsilon=\infty$. This result coincides with the one obtained in the first table, where the length of the loxodromic for the latitude of 90° is also 8788 miles.

DEPARTMENTS.

SOLUTIONS OF PROBLEMS.

ARITHMETIC.

114. Proposed by F. P. MATZ, M. Sc., Ph. D., Professor of Mathematics and Astronomy, Irving College, Mechanicsburg, Pa.

Does it pay a \$4-carpenter using a dozen four-penny nails per minute, to pick up a dropped nail? At this rate, should twenty-penny nails be picked up?

Solution by B. F. FINKEL, A. M., M. Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

The price of four-penny nails, at the present time, is 5 cents per pound. Assume that there are 200 nails to the pound, and that it takes the carpenter 10 seconds to pick up a nail.

The value of a nail is $\frac{5}{200}$ of a cent, or $\frac{1}{40}$ of a cent.

If we assume that the carpenter gets \$4.00 per day, and works 10 hours in a day, his wages is 40 cents per hour, or $\frac{1}{90}$ of a cent per second.

Hence, 10 seconds, the time required to pick up a nail, is worth $\frac{1}{9}$ of a cent.

Hence, since the value of the nail picked up is only $\frac{1}{40}$ of a cent, it does not pay the carpenter to pick up the nail, he losing thereby $\frac{1}{9} - \frac{1}{40}$ or $\frac{31}{360}$ of a cent.

It would not pay to pick up twenty-penny nails at the same rate.

115. Proposed by ALOIS F. KOVARIK, Instructor in Mathematics and Physics in Decorah Institute, Decorah, Ia.

Where shall a pole 120 feet high be broken so that the top may rest on the ground 40 feet from the foot? (Solve by arithmetic.)